



Canadian Space Agency
Agence spatiale
canadienne

Educational Product

Student's Edition

Grades 4-8

NEUROLAB FOR CLASSROOMS

***CANADIAN SPACE AGENCY
EDUCATIONAL MATERIALS
FOR STS-90 NEUROLAB***

Canada



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SPACE WALK

What happens when you lose the use of one of your senses?

Materials

Each group member needs

- A copy of the *Space Walk*, 2
- 4 different coloured pencils

What to Do

- Choose a leader to give instructions to the group.
- Read clearly and slowly and give your group members time to follow each step
 1. Place your pencil on the large dot beside the astronaut.
 2. Move up 6 spaces.
 3. Turn right and move 5 spaces
 4. Go up 3 spaces.
 5. Turn left and move 4 spaces.
 6. Go up 8 spaces.
 7. Turn right and move 7 spaces.
 8. Go down 5 spaces.
 9. Turn right and move 3 spaces.

Mission Accomplished!

- Now have your team repeat this procedure with their eyes closed. They should use a different colored pencil to mark their new path.
- Ask each team member to share how close he/she was to the target destination.

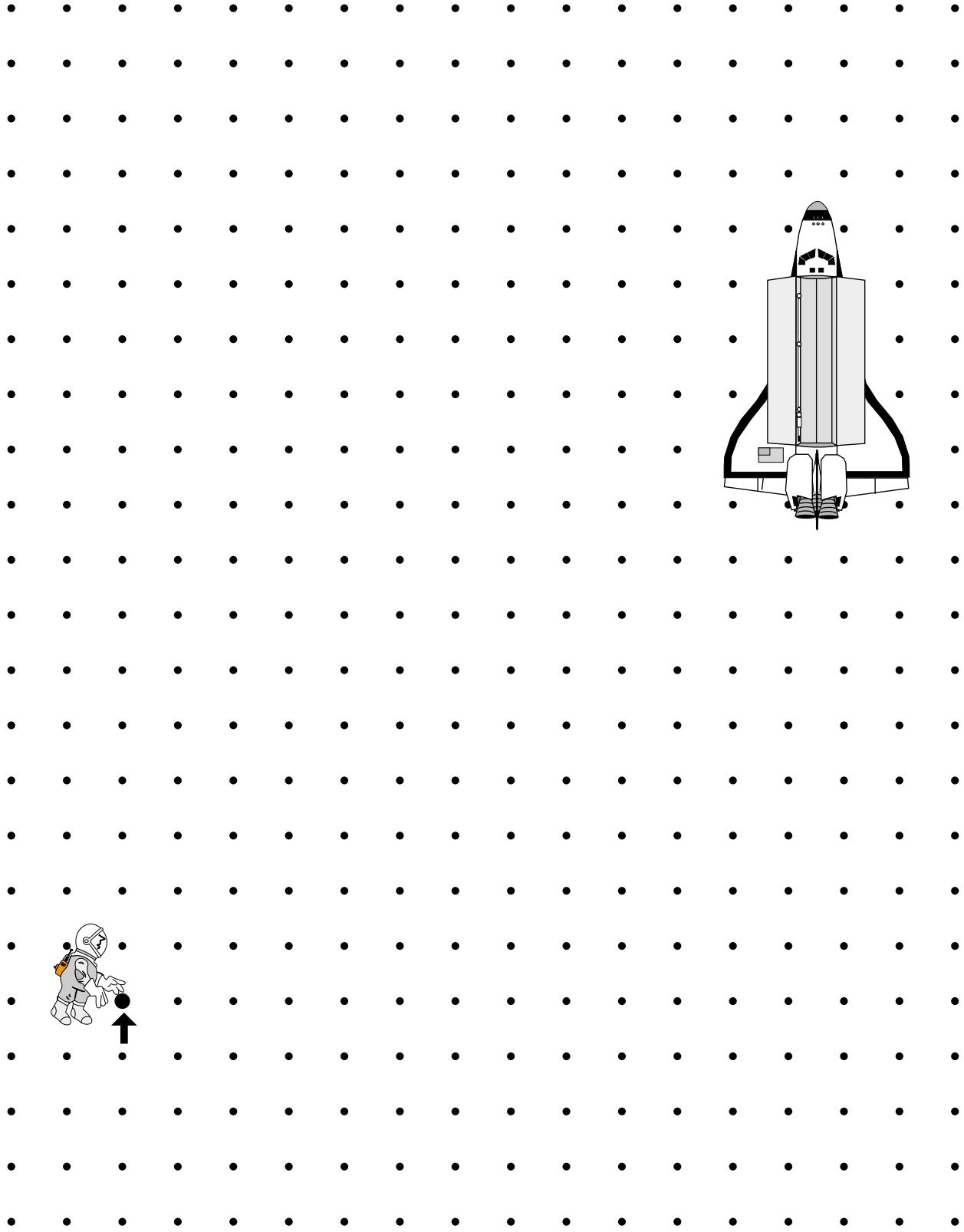
A hypothesis to test!

*If I try this four more times, would I be able to
Return to my starting point more accurately?*

- Using a different colored pencil each time, test the hypothesis.
 - Was it correct?
 - How did you adapt?
- Have each team member share his/her worksheet with the group.

2

SPACE WALK



DIZZY CIRCLES

3

Can you adjust your drawing skill to compensate for a change in your environment?

This activity will help you understand how you might feel in a weightless environment.

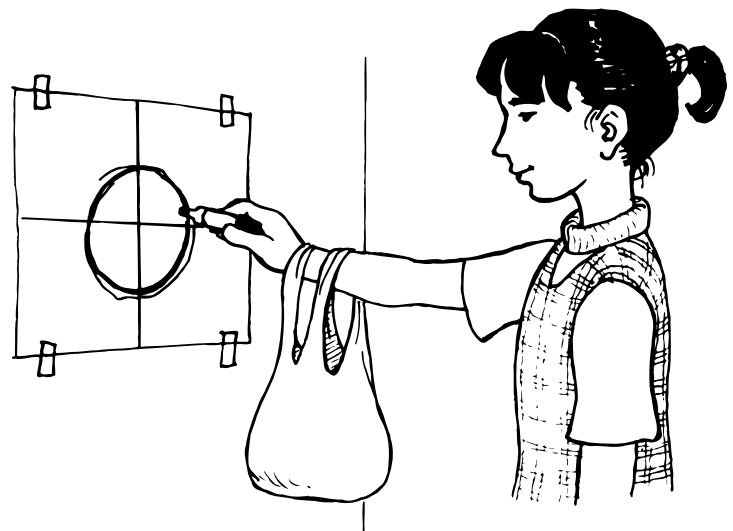
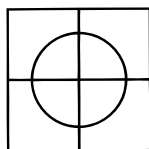
Materials

Each group needs:

- *Dizzy Circles*, 4 – 1 for each member
- poster size paper – 1 for each member
- set of markers (yellow, orange, red, blue, green, black)
- ruler
- circle pattern or compass
- 1 litre plastic bottle with cap
- water
- plastic shopping bag with handles

What to Do

- Divide the poster paper into four regions with a 1 dm (10 cm) circle in the centre.
- Assemble the weight by filling the bottle with water and putting it into the plastic shopping bag.
- Perform trials 1-3 with your eyes open and trials 4-6 with your eyes closed.
- Move quickly from one trial to the next.



Hint:

Slip your hand through the holes and let the weight rest behind your wrist.

3

DIZZY CIRCLES

- For each trial, trace over the circle ten times using the colour named on the chart.

Trial	Eyes	Colours	Weight
1.	open	yellow	without
2.	open	blue	with
3.	open	red	without
4.	closed	orange	without
5.	closed	green	with
6.	closed	black	without

- Record your results on your *Dizzy Circles* record sheet.
- Share your record sheet with the group and compare the group's findings.
- Which coloured circles show the least drifting from the centre circle?
 - Which coloured circles show the most drifting?
 - Did removing the weight affect how well you remained on the circle?
- Work together to prepare a conclusion to present to the class.

A hypothesis to test!

If I try this a few more times, will my skill improve?

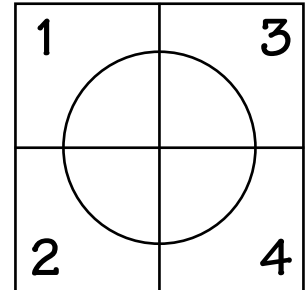
- Perform 3 more trials using different coloured markers.
- Record your new trial results under 7, 8, and 9 on your record sheet.

DIZZY CIRCLES

4

Record the results of your trials in the chart.

- Use the region numbers to describe the direction in which your lines drifted when you tried to trace the centre circle (CC).
- If you were able to trace the centre circle quite well, put a check mark under CC.
- If your marker drifted off the centre circle into one or more of the regions, put a check mark under the number of that region.



Trial	Eyes	Colours	Weight	CC	R ₁	R ₂	R ₃	R ₄
1.	open	yellow	without					
2.	open	blue	with					
3.	open	red	without					
4.	closed	orange	without					
5.	closed	green	with					
6.	closed	black	without					
7.								
8.								
9.								

- Look for patterns of when you drifted.
- Explain why you think that you drifted from the circle in some of the trials.

Testing the Hypothesis!

Was the hypothesis correct?

Did practice help you stop drifting from the centre circle?

5

SITTING ON THE CEILING

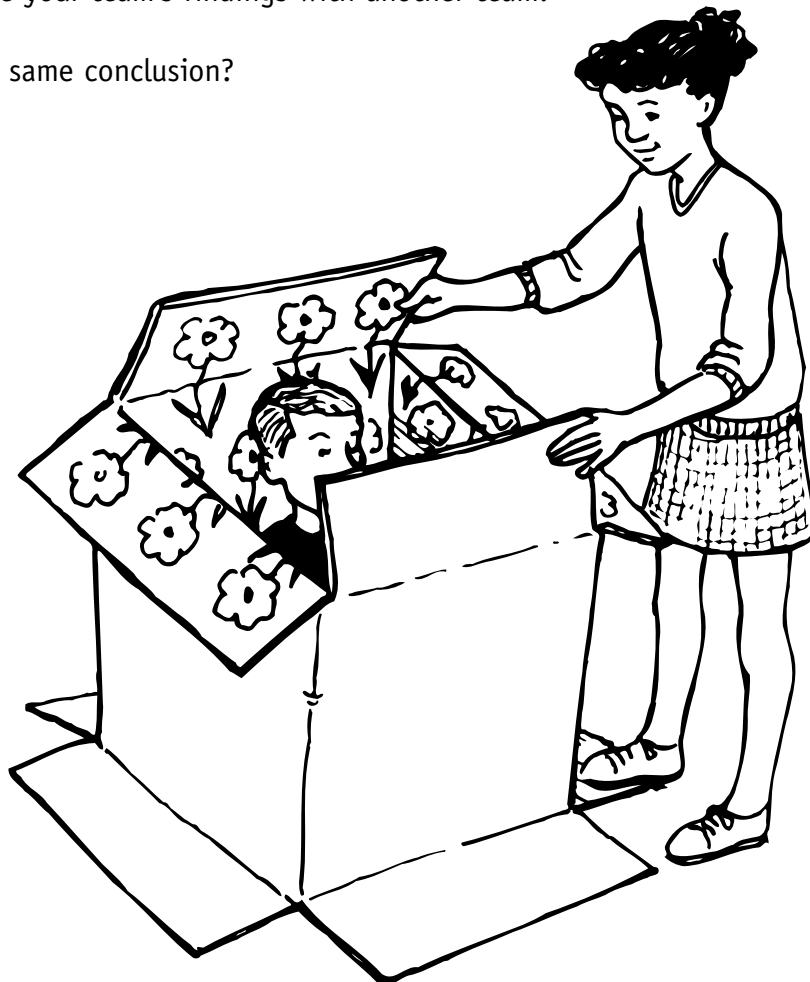
Materials

- A large box open at both ends and decorated on the inside walls
- A large piece of cardboard to act as a box lid (if there are no flaps on the box)

What to Do

- Choose one team member to sit inside the box on the floor. Cover the top with the lid. Ask what he/she sees.
- Remove and invert the box over the person again while he/she sits with eyes closed. Replace the lid. Ask again what he/she sees.
- Repeat with another team member and compare their reactions.
- Together, decide what explanation there might be for any differences.
- Share and compare your team's findings with another team.

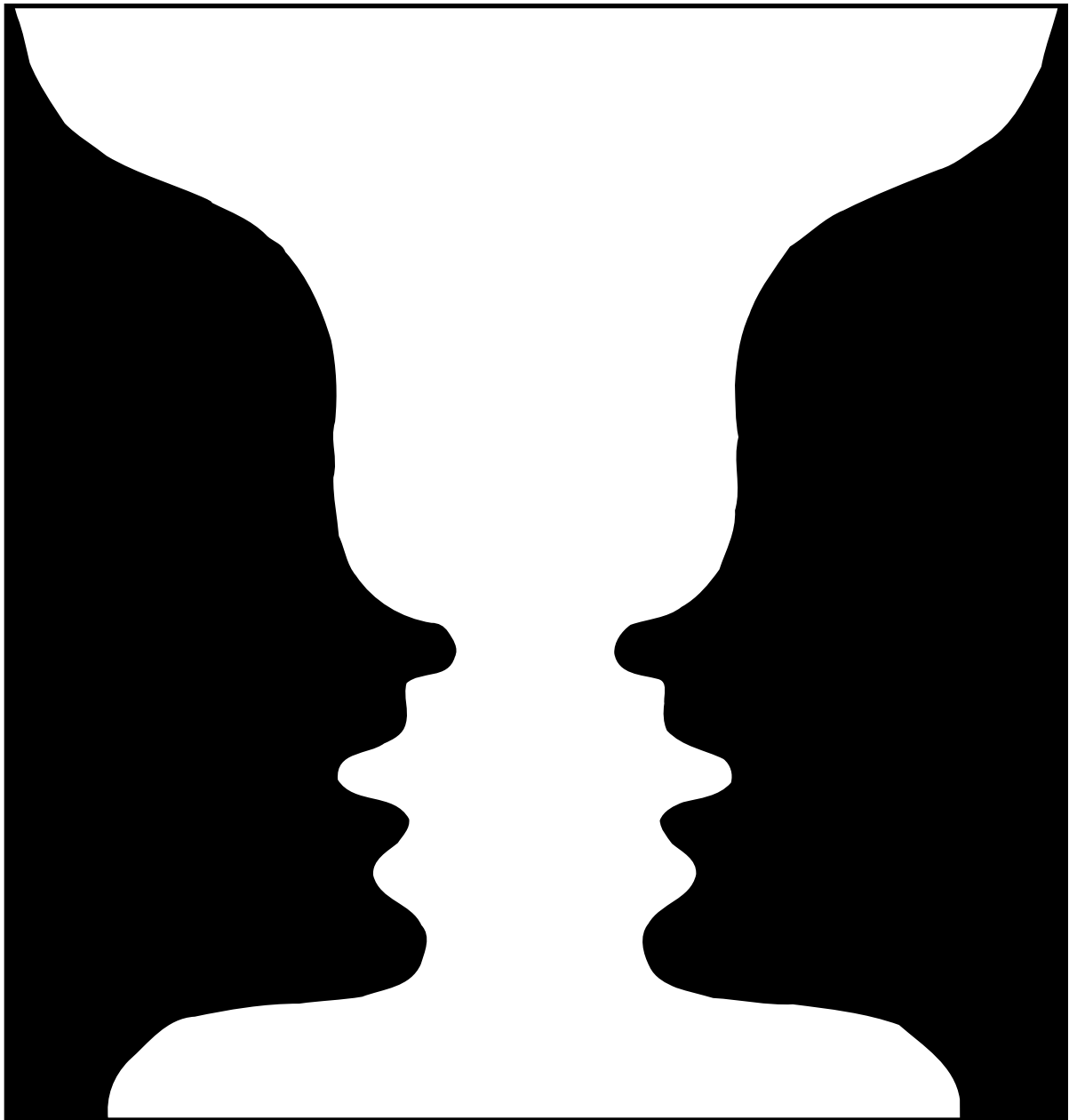
Did you reach the same conclusion?



SEEING IS NOT ALWAYS BELIEVING

6

What do you see?



7

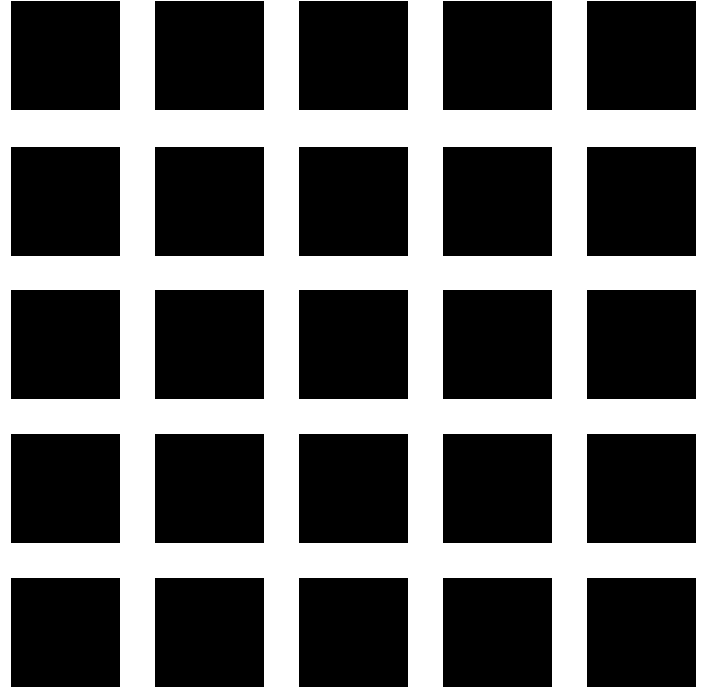
SEEING IS NOT ALWAYS BELIEVING

Stare at this figure for 10 seconds.

What do you see at the intersections of the white lines?

Stare at one of the grey dots.

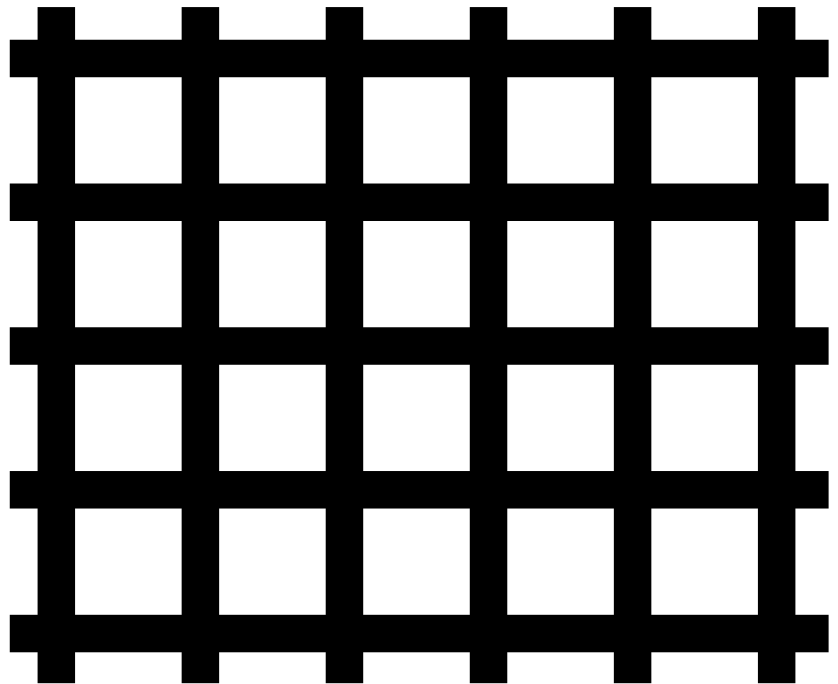
What happens?



Stare at this figure.

What happens?

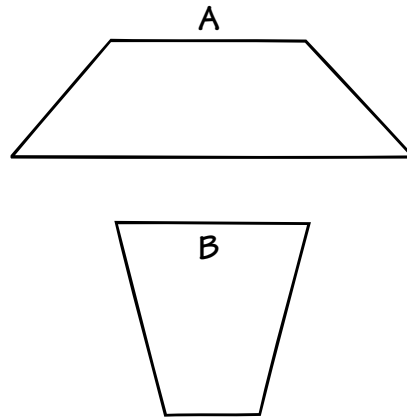
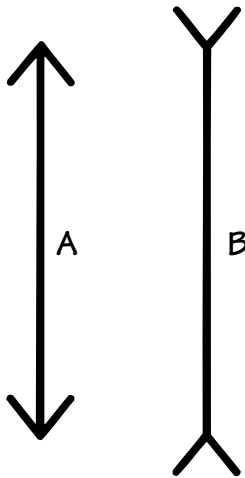
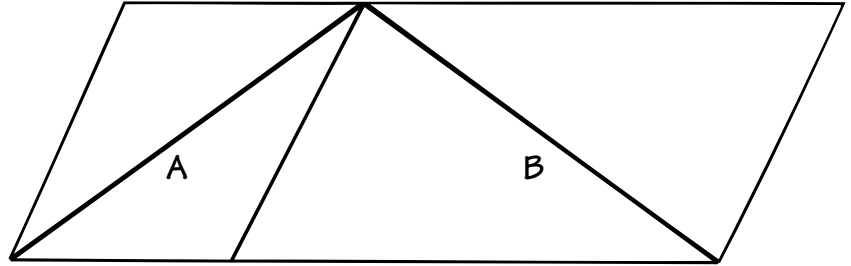
How can you make one of these dots disappear?



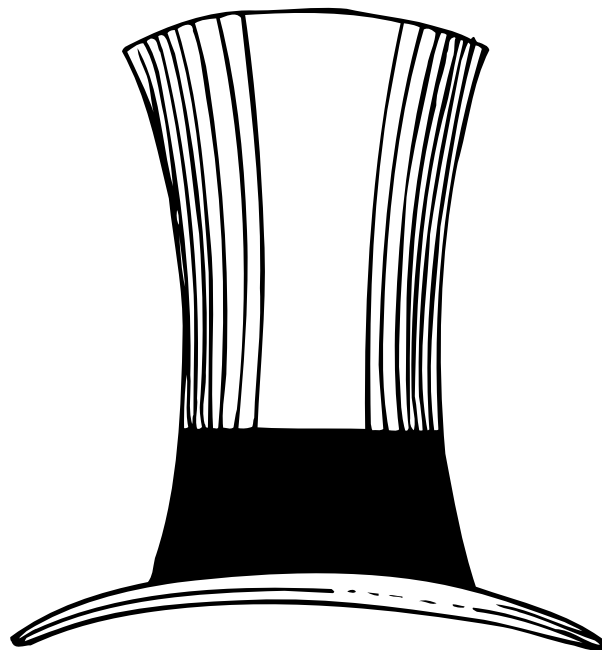
SEEING IS NOT ALWAYS BELIEVING

8

In each figure, which line is longer – A or B?



Is the hat as wide as it is tall?



9

SEEING IS NOT ALWAYS BELIEVING

There is a message in these lines. To discover the message, hold the page just below eye level and slant it away from you. Look first in the direction of arrow A, then arrow B, then arrow C.

